Tennessee Pollution Prevention Partnership Success Story

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Continuous Improvement Results in Zero Waste Process

The Member

DENSO, a leading global supplier of advanced automotive technology, systems and components to all the world's automakers, employs 106,000 associates in 32 countries. DENSO Manufacturing Athens Tennessee, Inc. (DMAT) employs approximately 900 associates. Automotive components and systems produced at DMAT include the following: oxygen sensors, fuel injectors, fuel rails, air-flow meters, ignition coils, monolithic carriers and spark plugs.

The Story

DMAT machines stainless steel to form fuel injector components. Large 6 spindle automatic lathes are used to fabricate some of the components. The lathes contain cutting oil and gear oil. The cutting oil has a lower viscosity than the gear oil. A low viscosity is needed to ensure the proper cutting performance is achieved. During the operation of the lathe, the cutting and gear oil become mixed. Eventually the viscosity in the cutting oil becomes too high and all of the lathe oils must be drained and replaced. Each of the six lathes contains approximately 220 gallons of cutting oil.

The finished stainless steel components are dip washed with Ozonic cleaner to remove the residual cutting oil. The spent cleaner is shipped off-site as a non-hazardous waste.

New Idea

Production Engineering worked with the chemical supplier to determine methods to extend the life of the cutting oil in the lathes. Periodically, new cutting oil is added to replenish the oil that is carried out on the finished parts. It was determined that the Ozonic cutting oil mixture could be added into the lathes' cutting oil tanks in the place of new cutting oil. The addition of the Ozonic cutting oil mixture reduced the viscosity in the cutting oil tank to the proper range needed for cutting performance.

The Success

The process change was successfully implemented in January of 2006. The process change has extended the oil life in the lathes to 12 to 24 months from 4 to 6 months. Production has been able to maintain the desired viscosity to ensure cutting performance and prevent tool damage.

Pollution Prevented

This project is an example of the continuous improvement in pollution prevention. The Ozonic cleaning fluid was the subject of DMAT's initial hazardous material project. The Ozonic cleaner replaced a hazardous chemical that generated over 14,000 lbs of hazardous waste per year from the dip washing process. This project has eliminated the disposal of approximately 1,000 gallons of non-hazardous ozonic waste per year and over 2,500 gallons of used oil. The project saved over $800 in waste disposal per year.

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